

Notice of Allowability

Application No.

10/809,848

Examiner

Angela J. Martin

Applicant(s)

FUKUI ET AL.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/11/07.
2. ☒ The allowed claim(s) is/are 1-16.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

The Applicant claims a negative electrode for a rechargeable lithium battery which is obtained by sintering under a non-oxidizing atmosphere, on a surface of a metal foil current collector, an anode mix layer containing a binder and particles of active material containing silicon and/or a silicon alloy; said negative electrode being characterized in that said metal foil current collector has projections and recesses on its surface, said projections are shaped to have a side face portion that curves inwardly from the base of the projection and curves outwardly as it extends closer to a distal end of the projection, and said binder penetrates into spaces defined by said side face portion.

Applicant claims a negative electrode for a rechargeable battery which is obtained by sintering under a non-oxidizing atmosphere on a surface of a metal foil current collector, an anode mix layer containing a binder and particles of active material containing silicon and/or a silicon alloy; said negative electrode being characterized in that said metal foil current collector has projections and recesses on its surface, said projections are shaped to have a side face portion that curves outwardly as it extends closer to a distal end of the projection, and said binder penetrates into spaces defined by said side face portions and being further characterized in that said particles Of active material penetrate into the spaces defined by the side face portions.

The Applicant claims a method for fabricating a negative electrode for a rechargeable lithium battery, characterized as including the steps of:

Art Unit: 1745

providing a metal foil current collector which has recesses and projections on its surface, said projections being shaped to have a side face portion that curves inwardly from the base of the projection and curves outwardly as it extends closer to a distal end of the projections; providing a layer of an anode mix on the surface of the metal foil current collector, the anode mix containing a binder and particles of active material that contains silicon and/or a silicon alloy; and sintering, under a non-oxidizing atmosphere, the anode mix layer while placed on the surface of the metal foil current collector.

In the prior art of record, Ikeda et al., EP 1244163 A1, discloses the projections on the current collector surface are conical in shape; a cone does not encompass a structure having a shape in which a recurved side face portion curves more outwardly as it extends closer to a distal end.

The prior art of record, taken either alone or in combination, fails to disclose or render obvious a negative electrode for a rechargeable lithium battery comprising an anode mix layer containing a binder and particles of active material containing silicon and/or silicon alloy; wherein metal foil current collector has projections and recesses on its surface, said projections are shaped to have a side face portion that curves inwardly from the base of the projection and curves outwardly as it extends closer to a distal end of the projection.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM


PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER